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BIOLOGICAL EVALUATION OF MYRTLE CREEK PROGENY SITES I AND II, SIX RIVERS NATIONAL FOREST

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ABSTRACT

Two Regional Tree Improvement Program Progeny Test sites on the Gasquet Ranger District were examined for insect and disease problems. At Myrtle Creek I, about 60% of the Douglas-fir seedlings planted in 1980 were chlorotic, probably due to physiological stress present before transplanting. Some of these seedlings were attacked by the Douglas-fir twig weevil. Myrtle Creek II, which is to be established and planted with Douglas-fir in 1982, had no apparent insect or disease problems. Black stain root disease had been found nearby in 1980. The significance of the findings is discussed for each site.

INTRODUCTION

On April 21, 1981, Myrtle Creek Progeny Test Sites I and II on the Gasquet Ranger District, Six Rivers National Forest, were examined to determine the presence of, or potential for, insect and disease problems which may affect the objectives of the Regional Tree Improvement Program. Observations and discussions of the two sites follow.

MYRTLE CREEK I

Observations

The site is located on road 17N22 off of the Low Divide Road from highway 197, and is within a Douglas-fir stand that was clearcut 10 to 15 years

previously. The site was prepared in the spring of 1980, and planted with superior Douglas-fir seedlings in April. An approximately 70-yard-wide strip of second-growth Douglas-fir was present immediately east of the site.

Approximately 60% of the seedlings were chlorotic, contrasting with the normal green foliage of the remaining 40% of the seedlings. Chlorosis was uniform throughout the crowns of the affected seedlings. No pattern to the seedlings with chlorosis was apparent. The chlorotic seedlings were randomly distributed throughout the site, and there was not any correlation with the coded numbers on the seedlings and chlorosis. Two adjacent seedlings (0700 and 0623) in the northeast corner of the site had dead stems with only a few live chlorotic needles at the soil line. Both seedlings contained larvae of the Douglas-fir twig weevil, Cylindrocopturus furnissi. One of these seedlings (0623) was removed and the root system examined. The roots apparently had not grown since being removed from the tube and placed in the soil. No pathogenic fungi were isolated from the roots.

No other insect or disease activity was noted on the site, in the adjacent clear cut, or in the strip of second-growth Douglas-fir. Phytophthora root rot of Port-Orford-cedar was present just east of the strip and also across the drainage west of the site, but the disease does not affect Douglas-fir.

Competition from other vegetation on the site was minimal. The two areas where brush piles and stumps were left during site preparation were carefully avoided during planting.

Discussion

The cause of the chlorosis was at first somewhat uncertain since it was apparently not related to insect or disease activity, progeny source, or site. Subsequent discussions with personnel in the Tree Improvement Program clarified the situation. Chuck Frank indicated that the seedlings were chlorotic in the fall of 1980. He indicated that the seedlings were in poor shape and were not growing well before they were placed in the ground, and they apparently never started growing after transplanting. Jay Kitzmiller indicated that the seedlings were probably in poor physiological condition to begin with.

The Douglas-fir twig weevil attacks noted on the two seedlings were likely a result of the stressed condition of the seedlings. The weevil normally attacks only trees under stress. Attacks are most common on poor sites, during drought years, and on trees under stress from brush or grass. Adults emerge from the middle of June to the first week in August. After feeding on tender twigs, they deposit eggs in small punctures on stems and branches. The larvae bore down to the cambium and feed between the bark and wood. The branch or stem is killed by destruction of the cambium. Larvae of all sizes overwinter and pupation takes place the following spring. Populations of the weevil in the test site may be expected to increase if the stressed seedlings don't recover.

MYRTLE CREEK II

Observations

The site is located on 17N22 about 1 1/2 miles north of Myrtle Creek I. The approximately seven-acre site presently contains a 60- to 70-year old second-growth stand of Douglas-fir which was marked for thinning (Savoy Unit 51). The High Site II area is scheduled for clearing and planting in 1982.

In general, the stand looked very good, except for overstocking and scattered dead, suppressed, pole-size Douglas-fir. Fruiting bodies of the red belt fungus, Fomes pinicola, which is mainly a decomposer of dead wood, were common on the dead trees. No other insect or disease activity was noted within the Unit.

However, on April 22, 1980, black stain root disease caused by Ceratocystis wageneri was found on one Douglas-fir tree along the road one-tenth of a mile south of the south end of the Unit. Other trees in the vicinity were checked for black stain at that time, but the disease was confirmed from only the one tree.

Trees along the road and around the margins of the Unit where disturbance from clearcutting occurred were examined this year for symptoms of black stain. None were found.

Discussion

Black stain root disease should be considered during and after establishment of the progeny test site. The fungus causing the disease spreads from tree to tree through root contacts, and possibly by growing a few centimeters through soil. The fungus then grows through the root up to the root crown where it colonizes other roots. Spread of the disease into new areas is probably a result of root-feeding insects carrying spores from an infected tree to an uninfected tree. Observations and studies suggest that stand disturbance, such as road building, thinnings, and margins of clear cuts, may increase the incidence of the disease. Even though the fungus spreads rapidly through root systems of living trees, it rarely spreads, or survives, in roots after the tree dies. The fungus persists for only a few years in wood of dead trees; therefore, host species can be replanted in centers several years after all infected trees are felled.

Cutting all trees and removal of as much root material as possible during site preparation should eliminate the fungus from the site if it is now present. The creation of a buffer strip around the margin of the proposed outplanting site would limit local spread via root contact from outside to within the site if the fungus is or becomes established in trees around the perimeter of the site. Insects from surrounding infected Douglas-fir may carry spores of the black stain fungus, feed on roots of the seedlings, and introduce the disease into the test site. Because only one infected tree

was located in the area, the number of spore-carrying beetles is probably small. Also, the suspected vector feeds occasionally on roots of weakened seedlings and therefore should have little or no impact on a properly planted site.